

IN THE CLAIMS:

Please amend claims 1 and 11 as follows:

1. (Currently Amended) A magnetoresistive film comprising:

an antiferromagnetic layer;

a first pinned ferromagnetic layer superposed on the antiferromagnetic layer, a ~~base-first~~ first interfacial roughness being formed between the antiferromagnetic layer and the first pinned ferromagnetic layer;

an antiferromagnetic bonding layer superposed on the first pinned ferromagnetic layer;

a second pinned ferromagnetic layer superposed on the antiferromagnetic bonding layer;

a compound existing ~~on~~ between the antiferromagnetic bonding layer and the second pinned ferromagnetic layer, said compound including at least one of oxygen, nitrogen, sulfur and carbon combined with an element included in the antiferromagnetic bonding layer;

a non-magnetic spacer layer superposed on the second pinned ferromagnetic layer, ~~an~~ a second interfacial roughness smaller than the ~~base-first~~ interfacial roughness being formed between the second pinned ferromagnetic layer and the non-magnetic spacer layer; and

a free ferromagnetic layer superposed on the non-magnetic spacer layer.

2. (Original) The magnetoresistive film according to claim 1, wherein said antiferromagnetic layer is a polycrystalline layer of a regulated lattice structure.

3. (Original) The magnetoresistive film according to claim 2, wherein said compound comprises at least one of an oxide, a nitride, a sulfide and a carbide.

4. (Cancelled)

5. (Previously Presented) The magnetoresistive film according to claim 1, wherein said antiferromagnetic bonding layer has a thickness in the range between 0.5nm and 0.9nm.

6. (Original) The magnetoresistive film according to claim 5, wherein said non-magnetic spacer layer has a thickness in the range between 1.9nm and 2.3nm.

7-10. (Cancelled)

11. (Currently Amended) A layered polycrystalline structure film comprising:

an antiferromagnetic layer;

a first crystalline ferromagnetic layer formed on the antiferromagnetic layer
and having a base-first interfacial roughness existing between the first crystalline
ferromagnetic layer and the antiferromagnetic layer;

an antiferromagnetic bonding layer formed on the first crystalline
ferromagnetic layer based on epitaxy;

a second crystalline ferromagnetic layer formed on the antiferromagnetic
bonding layer based on epitaxy; and

a compound existing ~~on~~ between the antiferromagnetic bonding layer and
the second crystalline ferromagnetic layer, said compound including at least one of
oxygen, nitrogen, sulfur and carbon combined with an element included in the
antiferromagnetic bonding layer,

wherein ~~said second crystalline ferromagnetic layer forms an~~ a second
interfacial roughness smaller than the ~~base-first~~ interfacial roughness at least at least
between the second crystalline ferromagnetic layer and the antiferromagnetic bonding
layer.

12. (Original) The layered polycrystalline structure film according to
claim 11, wherein said compound comprises at least one of an oxide, a nitride, a sulfide
and a carbide.

13. (Cancelled)

14. (Previously Presented) The magnetoresistive film according to claim 1, wherein said antiferromagnetic bonding layer is a Ru layer.

15. (Previously Presented) The layered polycrystalline structure film according to claim 11, wherein said antiferromagnetic bonding layer is a Ru layer.

IN THE CLAIMS:

Please amend claim 11 as follows:

1. (Previously Presented) A magnetoresistive film comprising:
 - an antiferromagnetic layer;
 - a first pinned ferromagnetic layer superposed on the antiferromagnetic layer, a first interfacial roughness being formed between the antiferromagnetic layer and the first pinned ferromagnetic layer;
 - an antiferromagnetic bonding layer superposed on the first pinned ferromagnetic layer;
 - a second pinned ferromagnetic layer superposed on the antiferromagnetic bonding layer;
 - a compound existing between the antiferromagnetic bonding layer and the second pinned ferromagnetic layer, said compound including at least one of oxygen, nitrogen, sulfur and carbon combined with an element included in the antiferromagnetic bonding layer;
 - a non-magnetic spacer layer superposed on the second pinned ferromagnetic layer, a second interfacial roughness smaller than the first interfacial roughness being formed between the second pinned ferromagnetic layer and the non-magnetic spacer layer; and
 - a free ferromagnetic layer superposed on the non-magnetic spacer layer.

2. (Original) The magnetoresistive film according to claim 1, wherein said antiferromagnetic layer is a polycrystalline layer of a regulated lattice structure.

3. (Original) The magnetoresistive film according to claim 2, wherein said compound comprises at least one of an oxide, a nitride, a sulfide and a carbide.

4. (Cancelled)

5. (Previously Presented) The magnetoresistive film according to claim 1, wherein said antiferromagnetic bonding layer has a thickness in the range between 0.5nm and 0.9nm.

6. (Original) The magnetoresistive film according to claim 5, wherein said non-magnetic spacer layer has a thickness in the range between 1.9nm and 2.3nm.

7-10. (Cancelled)

11. (Currently Amended) A layered polycrystalline structure film comprising:

an antiferromagnetic layer;

a first crystalline ferromagnetic layer formed on the antiferromagnetic layer and having a first interfacial roughness existing between the first crystalline ferromagnetic layer and the antiferromagnetic layer;

an antiferromagnetic bonding layer formed on the first crystalline ferromagnetic layer based on epitaxy;

a second crystalline ferromagnetic layer formed on the antiferromagnetic bonding layer based on epitaxy; and

a compound existing between the antiferromagnetic bonding layer and the second crystalline ferromagnetic layer, said compound including at least one of oxygen, nitrogen, sulfur and carbon combined with an element included in the antiferromagnetic bonding layer,

wherein a second interfacial roughness smaller than the first interfacial roughness ~~at least at least~~ is formed between the second crystalline ferromagnetic layer and the antiferromagnetic bonding layer.

12. (Original) The layered polycrystalline structure film according to claim 11, wherein said compound comprises at least one of an oxide, a nitride, a sulfide and a carbide.

13. (Cancelled)

14. (Previously Presented) The magnetoresistive film according to claim 1, wherein said antiferromagnetic bonding layer is a Ru layer.

15. (Previously Presented) The layered polycrystalline structure film according to claim 11, wherein said antiferromagnetic bonding layer is a Ru layer.